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EXAMINER	
MANDEVILLE, JASON M	
ART UNIT	**PAPER NUMBER**
2629	

NOTIFICATION DATE	DELIVERY MODE
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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Office Action Summary	Application No.	Applicant(s)	
	10/586,263	NAKADAIRA ET AL.	
	Examiner	Art Unit	
	JASON M. MANDEVILLE	2629	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *22 January 2010*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-8,10-20,22-24 and 37-44* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☒ Claim(s) *37-44* is/are allowed.

6)☒ Claim(s) *1-6,10,11,13-18,22 and 23* is/are rejected.

7)☒ Claim(s) *7,8,12,19,20 and 24* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *23 June 2008* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. **Claims 1-3 and 13-15** are rejected under 35 U.S.C. 103(a) as being unpatentable over Bell et al. (hereinafter "Bell" US 2005 / 0206582) in view of Suyama et al. (hereinafter "Suyama" US 6,525,699).

3. As pertaining to **Claim 1**, Bell discloses (see Fig. 1, Fig. 2, and Fig. 4) a three-dimensional display method for displaying two-dimensional images, by changing brightness, on a plurality of display planes (i.e., 3, 4) placed at different depth positions as seen from an observer (8) to display a three-dimensional stereoscopic image (see Page 1, Para. [0002]-[0006] and Para. [0010]-[0011]; Page 2, Para. [0016] and Para. [0022]-[0026]; Page 3, Para. [0030]-[0037], Para. [0040]-[0050], and Para. [0053]; Page 4, Para. [0062] and Para. [0073]-[0075]; and see Page 5, Para. [0081]), the method comprising:

generating first two-dimensional images (i.e., 11, 12) that are obtained by projecting a background plane (11, 12) onto the plurality of display planes (3, 4) along a

line of sight of the observer (8), and displaying the first two-dimensional images (11, 12) on the display planes (3, 4) respectively wherein brightness of each of the first two-dimensional images (11, 12) is determined independently for each display plane (3, 4) according to a depth position of a display object (i.e., 6, 7) in a three-dimensional space (see Fig. 2), if brightness of the display object (i.e., 6, 7) is darker than that of the background plane (i.e., 11, 12; see Page 5, Para. [0089] and Page 6, Para. [0098]-[0107]); and again, see Page 2, Para. [0022]-[0026]; Page 3, Para. [0030]-[0037], Para. [0040]-[0050], and Para. [0053]; Page 4, Para. [0062] and Para. [0073]-[0075]; and see Page 5, Para. [0081]); and

generating second two-dimensional images (i.e., 6, 7) that are obtained by projecting the display object (6, 7) onto the plurality of display planes (3, 4) along the line of sight of the observer (8), and displaying the second two-dimensional images (6, 7) on the display planes (3, 4) respectively in which brightness of each of the two-dimensional images (6, 7) is set to be the same among the display planes (3, 4) if the brightness of the display object (i.e., 6, 7) is darker than that of the background plane (11, 12; again see Page 2, Para. [0022]-[0026]; Page 3, Para. [0030]-[0037], Para. [0040]-[0050], and Para. [0053]; Page 4, Para. [0062] and Para. [0073]-[0075]; and see Page 5, Para. [0081]; and see Page 5, Para. [0089] and Page 6, Para. [0098]-[0107]).

It is implicit in the disclosure of Bell that the brightness of each of the two-dimensional images (6, 7) can be set to be any brightness, including the same

brightness, among the display planes (3, 4). However, Bell does not specifically state that the brightness of the second two-dimensional images is set to be the same among the display planes irrespective of a depth position of the display object. Still, Bell does explicitly state that the brightness of the two-dimensional images can be controlled in order to produce an apparent three-dimensional image (see Page 6, Para. [0098]-[0107], for example). While it may have been obvious to one of ordinary skill in the art at the time when the invention was made that the brightness of each of the second two-dimensional images can be set to be the same among the display planes irrespective of a depth position of the display object in order to produce a desired three-dimensional image, Bell does not explicitly state this feature.

However, Suyama explicitly discloses (see Fig. 3 through Fig. 8) a three-dimensional display method and associated display device for displaying two-dimensional images by changing brightness on a plurality of display planes placed at different depth positions as seen from an observer to display a three-dimensional stereoscopic image (see Col. 10, Ln. 32-67 through Col. 11, Ln. 1-60), wherein the brightness of each two-dimensional image is determined independently for each display plane according to a depth position of a display object in a three-dimensional space (again, see Col. 10, Ln. 32-67 through Col. 11, Ln. 1-60), and wherein brightness of the display object can be darker than that of a background plane (see Fig. 3 through Fig. 8) and wherein each two-dimensional image can be set to be the same among the display planes irrespective of a depth position of the display object if the brightness of the display object is darker than that of the background plane (see Col. 11, Ln. 48-52 and

Fig. 3 through Fig. 8). It is a goal of Suyama to provide a three-dimensional display method which can suppress contradictions among physiological factors for stereoscopy, is easily erased and programmed, and maintains a high display quality and brightness (see Col. 2, Ln. 22-64). Further, the inventions of Bell and Suyama are in the same field of endeavor and implement similar means for solving the same problem.

Therefore, it would have been obvious to one of ordinary skill in the art at the time when the invention was made to combine the teachings of Bell with the teachings of Suyama in order to improve the three-dimensional display method and device disclosed by Bell in the manner disclosed by Suyama to provide high display quality. As such, it would have been obvious to one of ordinary skill in the art to try a configuration in which the second two-dimensional images disclosed by Bell are set to the same brightness among the display planes (as disclosed by Suyama and implicitly disclosed by Bell) irrespective of the depth position of the display object if the brightness of the display object is darker than that of the background plane (i.e., in order to produce an optical illusion inherent in three-dimensional projections).

4. As pertaining to **Claim 2**, Bell discloses (see Fig. 2 and Fig. 4) that the brightness of each of the second two-dimensional images (6, 7) displayed on each display plane (3, 4) is 0 (see Page 5, Para. [0092]-[0095]; it is implicit in the disclosure of Bell that the second two-dimensional images can have a brightness of 0).

5. As pertaining to **Claim 3**, Bell discloses (see Fig. 2 and Fig. 4) that each of the second two-dimensional images (6, 7) is a two-dimensional image in which the displayed brightness is controlled by pixel values having predetermined levels of gray, and each pixel value of each of the second two-dimensional images (6, 7) displayed on each display plane (3, 4) is 0 (again, see Page 5, Para. [0092]-[0095]; it is implicit in the disclosure of Bell that the second two-dimensional images can have a brightness of 0).

6. As pertaining to **Claim 13**, Bell discloses (see Fig. 1, Fig. 2, and Fig. 4) a three-dimensional display apparatus for displaying two-dimensional images, by changing brightness, on a plurality of display planes (i.e., 3, 4) placed at different depth positions as seen from an observer (8) to display a three-dimensional stereoscopic image (see Page 1, Para. [0002]-[0006] and Para. [0010]-[0011]; Page 2, Para. [0016] and Para. [0022]-[0026]; Page 3, Para. [0030]-[0037], Para. [0040]-[0050], and Para. [0053]; Page 4, Para. [0062] and Para. [0073]-[0075]; and see Page 5, Para. [0081]), the apparatus comprising:

first means for generating first two-dimensional images (i.e., 11, 12; the first means for generating the first two-dimensional images is inherent in the existence of the first two-dimensional images (11, 12)) that are obtained by projecting a background plane (11, 12) onto the plurality of display planes (3, 4) along a line of sight of the observer (8; again, see Page 2, Para. [0022]-[0026]; Page 3, Para. [0030]-[0037], Para. [0040]-[0050], and Para. [0053]; Page 4, Para. [0062] and Para. [0073]-[0075];

and see Page 5, Para. [0081]; and see Page 5, Para. [0089] and Page 6, Para. [0098]-[0107]);

second means for displaying the first two-dimensional images (i.e., 11, 12) generated by the first means on the display planes (3, 4) respectively wherein brightness of each of the first two-dimensional images (11, 12) is determined independently for each display plane (3, 4) according to a depth position of a display object (i.e., 6, 7) in a three-dimensional space (see Fig. 2), if brightness of the display object (i.e., 6, 7) is darker than that of the background plane (i.e., 11, 12) so as to display the background plane at an arbitrary position in the three dimensional space (again, see Page 2, Para. [0022]-[0026]; Page 3, Para. [0030]-[0037], Para. [0040]-[0050], and Para. [0053]; Page 4, Para. [0062] and Para. [0073]-[0075]; and see Page 5, Para. [0081]; and see Page 5, Para. [0089] and Page 6, Para. [0098]-[0107]);

third means for generating second two-dimensional images (i.e., 6, 7; the third means for generating the second two-dimensional images is inherent in the existence of the second two-dimensional images (6, 7)) that are obtained by projecting the display object (6, 7) onto the plurality of display planes (3, 4) along a line of sight of the observer (8; again, see Page 2, Para. [0022]-[0026]; Page 3, Para. [0030]-[0037], Para. [0040]-[0050], and Para. [0053]; Page 4, Para. [0062] and Para. [0073]-[0075]; and see Page 5, Para. [0081]; and see Page 5, Para. [0089] and Page 6, Para. [0098]-[0107]);

fourth means for displaying the second two-dimensional images (i.e., 6, 7) generated by the third means on the display planes (3, 4) respectively in which brightness of each of the two-dimensional images (6, 7) is set to be the same among the display planes (3, 4) if the brightness of the display object (i.e., 6, 7) is darker than that of the background plane (11, 12; again see Page 2, Para. [0022]-[0026]; Page 3, Para. [0030]-[0037], Para. [0040]-[0050], and Para. [0053]; Page 4, Para. [0062] and Para. [0073]-[0075]; and see Page 5, Para. [0081]; and see Page 5, Para. [0089] and Page 6, Para. [0098]-[0107]).

It is implicit in the disclosure of Bell that the brightness of each of the two-dimensional images (6, 7) can be set to be any brightness, including the same brightness, among the display planes (3, 4). However, Bell does not specifically state that the brightness of the second two-dimensional images is set to be the same among the display planes irrespective of a depth position of the display object. Still, Bell does explicitly state that the brightness of the two-dimensional images can be controlled in order to produce an apparent three-dimensional image (see Page 6, Para. [0098]-[0107], for example). While it may have been obvious to one of ordinary skill in the art at the time when the invention was made that the brightness of each of the second two-dimensional images can be set to be the same among the display planes irrespective of a depth position of the display object in order to produce a desired three-dimensional image, Bell does not explicitly state this feature.

However, Suyama explicitly discloses (see Fig. 3 through Fig. 8) a three-dimensional display method and associated display device for displaying two-dimensional images by changing brightness on a plurality of display planes placed at different depth positions as seen from an observer to display a three-dimensional stereoscopic image (see Col. 10, Ln. 32-67 through Col. 11, Ln. 1-60), wherein the brightness of each two-dimensional image is determined independently for each display plane according to a depth position of a display object in a three-dimensional space (again, see Col. 10, Ln. 32-67 through Col. 11, Ln. 1-60), and wherein brightness of the display object can be darker than that of a background plane (see Fig. 3 through Fig. 8) and wherein each two-dimensional image can be set to be the same among the display planes irrespective of a depth position of the display object if the brightness of the display object is darker than that of the background plane (see Col. 11, Ln. 48-52). It is a goal of Suyama to provide a three-dimensional display method which can suppress contradictions among physiological factors for stereoscopy, is easily erased and programmed, and maintains a high display quality and brightness (see Col. 2, Ln. 22-64). Further, the inventions of Bell and Suyama are in the same field of endeavor and implement similar means for solving the same problem.

Therefore, it would have been obvious to one of ordinary skill in the art at the time when the invention was made to combine the teachings of Bell with the teachings of Suyama in order to improve the three-dimensional display method and device disclosed by Bell in the manner disclosed by Suyama to provide high display quality. As such, it would have been obvious to one of ordinary skill in the art to try a configuration

in which the second two-dimensional images disclosed by Bell are set to the same brightness among the display planes (as disclosed by Suyama and implicitly disclosed by Bell) irrespective of the depth position of the display object if the brightness of the display object is darker than that of the background plane (i.e., in order to produce an optical illusion inherent in three-dimensional projections).

7. As pertaining to **Claim 14**, Bell discloses (see Fig. 2 and Fig. 4) that the brightness of each of the second two-dimensional images (6, 7) displayed on each display plane (3, 4) is 0 (see Page 5, Para. [0092]-[0095]; it is implicit in the disclosure of Bell that the second two-dimensional images can have a brightness of 0).

8. As pertaining to **Claim 15**, Bell discloses (see Fig. 2 and Fig. 4) that each of the second two-dimensional images (6, 7) is a two-dimensional image in which the displayed brightness is controlled by pixel values having predetermined levels of gray, and each pixel value of each of the second two-dimensional images (6, 7) displayed on each display plane (3, 4) is 0 (again, see Page 5, Para. [0092]-[0095]; it is implicit in the disclosure of Bell that the second two-dimensional images can have a brightness of 0).

9. **Claims 4-6, 10-11, 16-18, and 22-23** are rejected under 35 U.S.C. 103(a) as being unpatentable over Bell in view of Sullivan (US 6,377,229).

10. As pertaining to **Claim 4**, Bell discloses (see Fig. 1, Fig. 2, and Fig. 4) a three-dimensional display method for displaying two-dimensional images, by changing brightness, on a plurality of display planes (i.e., 3, 4) placed at different depth positions as seen from an observer (8) to display a three-dimensional stereoscopic image (see Page 1, Para. [0002]-[0006] and Para. [0010]-[0011]; Page 2, Para. [0016] and Para. [0022]-[0026]; Page 3, Para. [0030]-[0037], Para. [0040]-[0050], and Para. [0053]; Page 4, Para. [0062] and Para. [0073]-[0075]; and see Page 5, Para. [0081]), the method comprising:

generating first two-dimensional images (i.e., 11, 12) that are obtained by projecting the background plane (11, 12) onto the plurality of display planes (3, 4) along a line of sight of the observer (8), and displaying the first two-dimensional images (11, 12) on the display planes (3, 4) respectively wherein brightness of each of the first two-dimensional images (11, 12) is determined independently for each display plane (3, 4) according to a depth position of a display object (i.e., 6, 7) in a three-dimensional space (see Fig. 2), if brightness of the display object (i.e., 6, 7) is brighter than that of the background plane (11, 12; see Page 5, Para. [0089] and Page 6, Para. [0098]-[0107]; and again, see Page 2, Para. [0022]-[0026]; Page 3, Para. [0030]-[0037], Para. [0040]-[0050], and Para. [0053]; Page 4, Para. [0062] and Para. [0073]-[0075]; and see Page 5, Para. [0081]); and

generating second two-dimensional images (i.e., 6, 7) that are obtained by projecting the display object (6, 7) onto the plurality of display planes (3, 4) along the line of sight of the observer (8), and displaying the second two-dimensional images (6,

7) on the display planes (3, 4) respectively in which brightness of each of the two-dimensional images (6, 7) is set to be the same among the display planes (3, 4) if the brightness of the display object (6, 7) is brighter than that of the background plane (11, 12; again see Page 2, Para. [0022]-[0026]; Page 3, Para. [0030]-[0037], Para. [0040]-[0050], and Para. [0053]; Page 4, Para. [0062] and Para. [0073]-[0075]; and see Page 5, Para. [0081]; and see Page 5, Para. [0089] and Page 6, Para. [0098]-[0107]).

Bell does not explicitly disclose that the method comprises controlling the transparency of the two-dimensional images. Further, Bell does not explicitly disclose that the transparency of each of the first two-dimensional images is changed independently for each display plane; nor does Bell disclose that the transparency of each of the two-dimensional images is set to be the same among the display planes irrespective of the depth position of the display object. However, Bell does disclose the use of transparent imaging screens (see Abstract; Page 3, Para. [0048]-[0053; and Page 4, Para. [0073]-[0075]).

Sullivan discloses (see Fig. 1 and Fig. 4 through Fig. 7) a three-dimensional display method for displaying two-dimensional images, by changing transparency, on a plurality of display planes (i.e., 36, 38, 40, 42) placed at different depth positions as seen from an observer (12) to display a three-dimensional stereoscopic image (see Abstract; also see Col. 1, Ln. 25-41; Col. 1, Ln. 65-67 through Col. 2, Ln. 1-49; Col. 4, Ln. 31-67 through Col. 5, Ln. 1-67 through Col. 6, Ln. 1-32), wherein, the transparency

of each of the two-dimensional images is changed independently for each display plane (36, 38, 40, 42; see Col. 10, Ln. 31-67 through Col. 11, Ln. 1-57). Further, Sullivan discloses (see Fig. 4 through Fig. 7) that the transparency of each two-dimensional image can be set to be the same among the display planes (36, 38, 40, 42) irrespective of the depth position of the display object if the brightness of the display object is brighter than that of the background plane (see Col. 10, Ln. 31-67 through Col. 11, Ln. 1-57). It is a goal of Sullivan to provide a high quality three-dimensional imaging method and apparatus with improved viewability and implementation. Further, the inventions of Sullivan and Bell are in the same field of endeavor.

Therefore, it would have been obvious to one of ordinary skill in the art at the time when the invention was made to combine the teachings of Bell and Sullivan in order to improve viewability and implementation.

11. As pertaining to **Claim 5**, Sullivan discloses (see Fig. 4 through Fig. 7) that the transparency of each of the second two-dimensional images (i.e., 6, 7; as disclosed by Bell) displayed on each display plane (i.e., 3, 4 as disclosed by Bell corresponding to 36, 38, 40, 42 as disclosed by Sullivan) is the maximum value (i.e., fully transparent; see Col. 10, Ln. 31-67 through Col. 11, Ln. 1-57).

12. As pertaining to **Claim 6**, Sullivan discloses (see Fig. 4 through Fig. 7) that each of the second two-dimensional images (6, 7 as disclosed by Bell) is a two-dimensional image in which the transparency of the display plane (i.e., 3, 4 as disclosed by Bell

corresponding to 36, 38, 40, 42 as disclosed by Sullivan) is controlled by pixel values having predetermined levels of gray, and each pixel value of each of the second two-dimensional images (6, 7 as disclosed by Bell) displayed on each display plane ((i.e., 3, 4 as disclosed by Bell corresponding to 36, 38, 40, 42 as disclosed by Sullivan) is a value representing the maximum transparency (i.e., fully transparent; again, see Col. 10, Ln. 31-67 through Col. 11, Ln. 1-57).

13. As pertaining to **Claim 10**, Sullivan discloses (see Fig. 4 through Fig. 7 of Sullivan) that the display object (i.e., 6, 7 as also disclosed by Bell) is character information (i.e., text; see Col. 6, Ln. 66-67 through Col. 7, Ln. 1-8);

the background plane is a background of a screen on which the character information is input or edited (i.e., displayed; see (36, 38, 40, 42); also see Col. 10, Ln. 31-67 through Col. 11, Ln. 1-57); and

a background plane of a selected character information part is displayed at a depth position different from a depth position at which a background plane of other character information is displayed (see Fig. 4 through Fig. 7; and again, see Col. 10, Ln. 31-67 through Col. 11, Ln. 1-57).

14. As pertaining to **Claim 11**, Sullivan discloses (see Fig. 4 through Fig. 7 of Sullivan) that the display object (i.e., 6, 7 as also disclosed by Bell) is character information (i.e., text; see Col. 6, Ln. 66-67 through Col. 7, Ln. 1-8);

the background plane is a background of a screen on which the character information is input or edited (i.e., displayed; see (36, 38, 40, 42); also see Col. 10, Ln. 31-67 through Col. 11, Ln. 1-57); and

a background plane of a character information part that is searched by a search function (i.e., visually scanned) is displayed at a depth position different from a depth position at which a background plane of other character information is displayed (see Fig. 4 through Fig. 7; and again, see Col. 10, Ln. 31-67 through Col. 11, Ln. 1-57).

15. As pertaining to **Claim 16**, Bell discloses (see Fig. 1, Fig. 2, and Fig. 4) a three-dimensional display apparatus for displaying two-dimensional images on a plurality of transmissive display apparatuses (i.e., 3, 4; see Abstract; see Page 2, Para. [0020]; Page 3, Para. [0048]-[0050]; and Page 4, Para. [0058]-[0062] and Para. [0073]-[0076]) placed at different depth positions as seen from an observer (8) to display a three-dimensional stereoscopic image (see Page 1, Para. [0002]-[0006] and Para. [0010]-[0011]; Page 2, Para. [0016] and Para. [0022]-[0026]; Page 3, Para. [0030]-[0037], Para. [0040]-[0050], and Para. [0053]; Page 4, Para. [0062] and Para. [0073]-[0075]; and see Page 5, Para. [0081]), the apparatus comprising:

first means for generating first two-dimensional images (i.e., 11, 12; the first means for generating the first two-dimensional images is inherent in the existence of the first two-dimensional images (11, 12)) that are obtained by projecting the background plane (11, 12) onto a plurality of display planes (3, 4) of the transmissive display apparatuses (3, 4) along a line of sight of the observer (8; again, see Page 2,

Para. [0022]-[0026]; Page 3, Para. [0030]-[0037], Para. [0040]-[0050], and Para. [0053]; Page 4, Para. [0062] and Para. [0073]-[0075]; and see Page 5, Para. [0081]; and see Page 5, Para. [0089] and Page 6, Para. [0098]-[0107]);

second means for displaying the first two-dimensional images (i.e., 11, 12) generated by the first means on the transmissive display apparatuses (3, 4) respectively wherein brightness of each of the first two-dimensional images (11, 12) is determined independently for each transmissive display apparatus (3, 4) to display the background plane at an arbitrary position in the three dimensional space according to a depth position of a display object (i.e., 6, 7) in a three-dimensional space (see Fig. 2), if brightness of the display object (6, 7) is brighter than that of the background plane (11, 12; see Page 5, Para. [0089] and Page 6, Para. [0098]-[0107]; and again, see Page 2, Para. [0022]-[0026]; Page 3, Para. [0030]-[0037], Para. [0040]-[0050], and Para. [0053]; Page 4, Para. [0062] and Para. [0073]-[0075]; and see Page 5, Para. [0081]);

third means for generating second two-dimensional images (i.e., 6, 7; the third means for generating the second two-dimensional images is inherent in the existence of the second two-dimensional images (6, 7)) that are obtained by projecting the display object (6, 7) onto the plurality of display planes (3, 4) of the transmissive display apparatuses (3, 4) along the line of sight of the observer (8; again, see Page 2, Para. [0022]-[0026]; Page 3, Para. [0030]-[0037], Para. [0040]-[0050], and Para. [0053]; Page 4, Para. [0062] and Para. [0073]-[0075]; and see Page 5, Para. [0081]; and see Page 5, Para. [0089] and Page 6, Para. [0098]-[0107]);

fourth means for displaying the second two-dimensional images (i.e., 6, 7) generated by the third means on the transmissive display apparatuses (3, 4) respectively in which brightness of each of the two-dimensional images (6, 7) is set to be the same among the transmissive display apparatuses (3, 4) if the brightness of the display object (6, 7) is darker than that of the background plane (11, 12; again, see Page 2, Para. [0022]-[0026]; Page 3, Para. [0030]-[0037], Para. [0040]-[0050], and Para. [0053]; Page 4, Para. [0062] and Para. [0073]-[0075]; and see Page 5, Para. [0081]; and see Page 5, Para. [0089] and Page 6, Para. [0098]-[0107]).

Bell does not explicitly disclose that the transparency of each of the first two-dimensional images is changed independently for each transmissive display apparatus; nor does Bell disclose that the transparency of each of the two-dimensional images is set to be the same among the transmissive display apparatuses irrespective of the depth position of the display object. However, Bell does disclose the use of transparent imaging screens (see Abstract; Page 3, Para. [0048]-[0053; and Page 4, Para. [0073]-[0075]).

Sullivan discloses (see Fig. 1 and Fig. 4 through Fig. 7) a three-dimensional display method and associated apparatus for displaying two-dimensional images on a plurality of transmissive display apparatuses (i.e., 36, 38, 40, 42) placed at different depth positions as seen from an observer (12) to display a three-dimensional stereoscopic image (see Abstract; also see Col. 1, Ln. 25-41; Col. 1, Ln. 65-67 through Col. 2, Ln. 1-49; Col. 4, Ln. 31-67 through Col. 5, Ln. 1-67 through Col. 6, Ln. 1-32),

wherein, the transparency of each of the two-dimensional images is changed independently for each transmissive display apparatus (36, 38, 40, 42; see Col. 10, Ln. 31-67 through Col. 11, Ln. 1-57). Further, Sullivan discloses (see Fig. 4 through Fig. 7) that the transparency of each two-dimensional image can be set to be the same among the display planes (36, 38, 40, 42) irrespective of the depth position of the display object if the brightness of the display object is darker than that of the background plane (see Col. 10, Ln. 31-67 through Col. 11, Ln. 1-57). It is a goal of Sullivan to provide a high quality three-dimensional imaging method and apparatus with improved viewability and implementation. Further, the inventions of Sullivan and Bell are in the same field of endeavor.

Therefore, it would have been obvious to one of ordinary skill in the art at the time when the invention was made to combine the teachings of Bell and Sullivan in order to improve viewability and implementation.

16. As pertaining to **Claim 17**, Sullivan discloses (see Fig. 4 through Fig. 7) that the transparency of each of the second two-dimensional images (i.e., 6, 7; as disclosed by Bell) displayed on each transmissive display apparatus (i.e., 3, 4 as disclosed by Bell corresponding to 36, 38, 40, 42 as disclosed by Sullivan) is the maximum value (i.e., fully transparent; see Col. 10, Ln. 31-67 through Col. 11, Ln. 1-57).

17. As pertaining to **Claim 18**, Sullivan discloses (see Fig. 4 through Fig. 7) that each of the second two-dimensional images (6, 7 as disclosed by Bell) is a two-dimensional

image in which the transparency on the transmissive display apparatus (i.e., 3, 4 as disclosed by Bell corresponding to 36, 38, 40, 42 as disclosed by Sullivan) is controlled by pixel values having predetermined levels of gray, and each pixel value of each of the second two-dimensional images (6, 7 as disclosed by Bell) displayed on each transmissive display apparatus ((i.e., 3, 4 as disclosed by Bell corresponding to 36, 38, 40, 42 as disclosed by Sullivan) is a value representing the maximum transparency (again, see Col. 10, Ln. 31-67 through Col. 11, Ln. 1-57).

18. As pertaining to **Claim 22**, Sullivan discloses (see Fig. 4 through Fig. 7 of Sullivan) that the display object (i.e., 6, 7 as also disclosed by Bell) is character information (i.e., text; see Col. 6, Ln. 66-67 through Col. 7, Ln. 1-8);

the background plane is a background of a screen on which the character information is input or edited (i.e., displayed; see (36, 38, 40, 42); also see Col. 10, Ln. 31-67 through Col. 11, Ln. 1-57); and

the second means (as disclosed by Bell) displays a background plane of a selected character information part is displayed at a depth position different from a depth position at which a background plane of other character information is displayed (see Fig. 4 through Fig. 7; and again, see Col. 10, Ln. 31-67 through Col. 11, Ln. 1-57).

19. As pertaining to **Claim 23**, Sullivan discloses (see Fig. 4 through Fig. 7 of Sullivan) that the display object (i.e., 6, 7 as also disclosed by Bell) is character information (i.e., text; see Col. 6, Ln. 66-67 through Col. 7, Ln. 1-8);

the background plane is a background of a screen on which the character information is input or edited (i.e., displayed; see (36, 38, 40, 42); also see Col. 10, Ln. 31-67 through Col. 11, Ln. 1-57); and

the second means (as disclosed by Bell) displays a background plane of a character information part that is searched by a search function (i.e., visually scanned) is displayed at a depth position different from a depth position at which a background plane of other character information is displayed (see Fig. 4 through Fig. 7; and again, see Col. 10, Ln. 31-67 through Col. 11, Ln. 1-57).

Allowable Subject Matter

20. **Claims 7-8, 12, 19-20, and 24** are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

21. The following is a statement of reasons for the indication of allowable subject matter: none of the references relied upon by the examiner alone or in combination teach or fairly suggest the limitations of **Claims 7-8, 12, 19-20, and 24**.

22. As pertaining to **Claim 7**, none of the relied upon references teach or fairly suggest a background plane of lines after a line including a cursor indicating an

inputting or editing position of the character information is displayed at a depth position different from a depth position at which a background plane of the line including the cursor and lines before the line including the cursor is displayed.

23. As pertaining to **Claim 8**, none of the relied upon references teach or fairly suggest a background plane of a line including a cursor indicating an inputting or editing position of the character information and lines after the line including the cursor is displayed at a depth position different from a depth position at which a background plane of lines before the line including the cursor is displayed.

24. As pertaining to **Claim 12**, none of the relied upon references teach or fairly suggest that the background plane is a background of a table or a menu in which character information are arranged and from which a piece of character information can be selected; and a background plane of a selected character information part is displayed at a depth position different from a depth position at which a background plane of other character information is displayed.

25. As pertaining to **Claim 19**, none of the relied upon references teach or fairly suggest that the second means displays a background plane of lines after a line including a cursor indicating an inputting or editing position of the character information at a depth position different from a depth position at which a background plane of the line including the cursor and lines before the line including the cursor is displayed.

26. As pertaining to **Claim 20**, none of the relied upon references teach or fairly suggest that the second means displays a background plane of a line including a cursor indicating an inputting or editing position of the character information and lines after the line including the cursor at a depth position different from a depth position at which a background plane of lines before the line including the cursor is displayed.

27. As pertaining to **Claim 24**, none of the relied upon references teach or fairly suggest that the background plane is a background of a table or a menu in which character information are arranged and from which a piece of character information can be selected; and the second means displays a background plane of a selected character information part at a depth position different from a depth position at which a background plane of other character information is displayed.

28. **Claims 37-44** are allowed.

29. As allowable subject matter has been indicated, applicant's reply must either comply with all formal requirements or specifically traverse each requirement not complied with. See 37 CFR 1.111(b) and MPEP § 707.07(a).

30. The following is an examiner's statement of reasons for allowance: none of the references relied upon by the examiner alone or in combination teach or fairly suggest the limitations of **Claims 37-44**.

31. As pertaining to **Claim 37**, none of the relied upon references teach or fairly suggest a brightness value determination step of determining whether a brightness value of the display object is equal to or less than a predetermined threshold and the brightness value of the display object is less than a brightness value of the background; and a brightness value calculation step of, when it is determined that the brightness value of the display object is equal to or less than the predetermined threshold and the brightness value of the display object is less than the brightness value of the background, calculating the brightness value of each two-dimensional image of the background according to depth information of the display object and setting brightness values of the two-dimensional images of the display object to be the same.

32. As pertaining to **Claim 38**, none of the relied upon references teach or fairly suggest a brightness value determination step of determining whether a brightness value of the display object is equal to or less than a predetermined threshold; and a brightness value calculation step of, when the brightness value of the display object is equal to or less than the predetermined threshold, changing the brightness value of the background to a value greater than the brightness value of the display object, and calculating the brightness value of each two-dimensional image of the background

based on the changed brightness value according to depth information of the display object and setting brightness values of the two-dimensional images of the display object to be the same.

33. As pertaining to **Claim 39**, none of the relied upon references teach or fairly suggest a brightness value determination step of determining whether a brightness value of the display object is equal to or greater than a predetermined threshold and the brightness value of the display object is greater than a brightness value of the background; and a transparency value calculation step of, when it is determined that the brightness value of the display object is equal to or greater than the predetermined threshold and the brightness value of the display object is greater than the brightness value of the background, calculating a transparency value of each two-dimensional image of the background according to depth information of the display object and setting transparency values of the two-dimensional images of the display object to be the same.

34. As pertaining to **Claim 40**, none of the relied upon references teach or fairly suggest a brightness value determination step of determining whether a brightness value of the display object is equal to or greater than a predetermined threshold; and a transparency value calculation step of, when the brightness value of the display object is equal to or greater than the predetermined threshold, changing the brightness value of the background to a value less than the brightness value of the display object, and

calculating the transparency value of each two-dimensional image of the background based on the changed brightness value according to depth information of the display object and setting transparency values of the two-dimensional images of I0 the display object to be the same.

35. As pertaining to **Claim 41**, none of the relied upon references teach or fairly suggest brightness value determination means for comparing a brightness value of the display object with another brightens value; wherein, when it is determined that the brightness value of the display object is equal to or less than the predetermined threshold and the brightness value of the display object is less than the brightness value of the background by the brightness determination means, the brightness value calculation means calculates the brightness value of each two-dimensional image of the background according to depth information of the display object and sets brightness values of the two-dimensional images of the display object to be the same.

36. As pertaining to **Claim 42**, none of the relied upon references teach or fairly suggest brightness value determination means for comparing a brightness value of the display object with another brightens value; wherein, when it is determined that the brightness value of the display object is equal to or less than the predetermined threshold by the brightness determination means, the brightness value calculation means changes the brightness value of the background to a value greater than the brightness value of the display object, and calculates the brightness value of each

two-dimensional image of the background based on the changed brightness value according to depth information of the display object and sets brightness values of the two-dimensional images of the display object to be the same.

37. As pertaining to **Claim 43**, none of the relied upon references teach or fairly suggest brightness value determination means for comparing a brightness value of the display object with another brightens value; wherein, when it is determined that the brightness value of the display object is equal to or greater than the predetermined threshold and the brightness value of the display object is greater than the brightness value of the background by the brightness determination means, the transparency value calculation means calculates a transparency value of each two-dimensional image of the background according to depth information of the display object and sets transparency values of the two-dimensional images of the display object to be the same.

38. As pertaining to **Claim 44**, none of the relied upon references teach or fairly suggest brightness value determination means for comparing a brightness value of the display object with another brightens value; wherein, when it is determined that the brightness value of the display object is equal to or greater than the predetermined threshold by the brightness determination means, the transparency value calculation means changes the brightness value of the background to a value less than the brightness value of the display object, and calculates the transparency value of each

two- dimensional image of the background based on the changed brightness value according to depth information of the display object and sets transparency values of the two-dimensional images of the display object to be the same.

39. Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Response to Arguments

40. Applicant's arguments filed 26 August 2009 have been fully considered but they are not persuasive. **Claims 37-44** are allowed. **Claims 7-8, 12, 19-20, and 24** are objected to as being dependent upon a rejected base claim. As pertaining to **Claims 1-3 and 13-15** and **Claims 4-6, 10-11, 16-18, and 22-23**, the applicant has argued that none of the references relied upon in the prior office action, namely Bell, Suyama, and Sullivan teach or fairly suggest that the brightness of a first two-dimensional image can be determined independently for each display plane according to a depth position of a display object in a three-dimensional space, wherein brightness of the display object is darker than that of the background plane, and wherein the brightness and/or

transparency of the second two-dimensional images can be set to be the same among the display planes irrespective of a depth position of the display object if the brightness of the display object is darker than that of the background plane. The examiner respectfully disagrees. As stated previously, all of Bell, Suyama, and Sullivan clearly teach that the brightness of a first two-dimensional image can be determined independently for a display plane in a multi-plane system according to a depth position of a display object. Furthermore, it is both an implied and an obvious feature of the teachings of Bell and Suyama that the two-dimensional images on each of the display planes can be set to any brightness level independently (see above rejections). Thus, clearly the brightness of a display object can be darker than the brightness of a background plane and clearly the two-dimensional images can be set to the same brightness. The examiner has relied on the teachings of Suyama simply as a means of showing what this implied and obvious feature of the teachings of Bell. Further, Sullivan explicitly discloses that the transparency of the two-dimensional images on each of the display planes can be set independently and that each of the two-dimensional images can be set to be the same irrespective of the depth position of the display object (see above rejections). Therefore, the rejection of **Claims 1-3 and 13-15** and **Claims 4-6, 10-11, 16-18, and 22-23** is maintained. (The examiner would again like to point out that there is a clear distinction between the allowed independent claims and the above rejected claims. In reference to the allowed independent claims, a concrete method or apparatus for generating a three-dimensional stereoscopic image is claimed with clear steps for calculating brightness or transparency. It is the opinion of the examiner that, in

contrast, the rejected claims merely recite method steps or apparatuses in which brightness or transparency is adjusted without connecting the adjustment to any calculation step or function. The rejected claims recite only that which is known in the art and/or would have been obvious to one of ordinary skill as a result of implementing the teachings of Bell, Suyama, and Sullivan.)

Furthermore, the applicant has argued that there would “be no need to cite to such a large number of paragraphs" in the references relied upon by the examiner "if the claimed feature were truly disclosed" by those references. The examiner would respectfully like to point out that “a large number of paragraphs” have been cited in the above references as a means of guiding the applicant to consider the teachings of the relied upon references, and the cited paragraphs, as a whole. The examiner respectfully reminds the applicant that the test for obviousness is not based solely on "pinpoint" citations and explicit recitations of claim language in the body of the reference. Rather, the test for obviousness is based on that which is collectively known in the prior art and/or would have been obvious to one of ordinary skill in the art at the time when the invention was made. The examiner believes that the teachings of Bell, Suyama, and Sullivan render obvious the rejected claims above. Furthermore, the examiner has expressly pointed out the differences between the allowed claims and the rejected claims, and the reasons for such rejections.

Conclusion

41. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to JASON M. MANDEVILLE whose telephone number is 571-270-3136. The examiner can normally be reached on Monday through Friday 7:30 AM to 5:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Alexander Eisen can be reached on 571-272-7687. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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